ABSTRACT OF THE DISCLOSURE

[0082] A system and method employing infrared laser spectrography and dual wavelength modulation to monitor the concentration of a gas, such as oxygen or carbon dioxide, in the sample vial, or to monitor the pressure in the sample vial, to thus detect for microorganism growth in the sample vial. The system and method each employ an energy emitting device, such as an infrared laser, a detector and a signal analyzer, such as a spectroscopy device. The infrared laser emits toward the container infrared energy having a substantially single wavelength substantially equal to a wavelength at which the gas absorbs the infrared energy. The detector detects a portion of the energy signal that passes through the container, and the signal analyzer spectroscopically analyzes the detected portion of the energy signal to determine whether the gas exists in the container, or to determine the pressure in the container. The system and method thus determines whether an organism or cell of interest is present or viable in the container based on the results of the gas or pressure detection.